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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,528	03/30/2001	Han-Ming Wu	4290P10627	7457

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EXAMINER	
KACKAR, RAM N	
ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/823,528	WU ET AL.	
	Examiner	Art Unit	
	Ram N Kackar	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7-14,30 and 31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-14 and 30-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims1-4, 7-11, 13-14 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa Kaoru (JP 04144130) in view of Lenz et al (US 5534751) and Ilya Perlov (US 5421893).

Ogawa Kaoru discloses a plasma chamber for etching (Abstract and Fig 3), a circular (solid) shield plate to control the distribution of ion density on the substrate and a support structure for the shield plate (Fig 3).

Ogawa Kaoru does not explicitly disclose the thickness of the shield plate, the plate and supporting structure made of dielectric material and the support structure comprising three supports.

Lenz et al disclose a plasma chamber (Fig 1), a circular shield plate with rounded corner edges (Col 7 line 16), shield plates (Fig 2 and Col 6 lines 16-26) made of dielectric to confine the plasma (to actively direct ion flux), a support structure also of dielectric having 6 support members (Fig 2) to suspend the shield and the thickness of shield plate to be 2.4 mm (Col 7 line 8). The apparatus disclosed by Lenz et al discloses that the apparatus could be used for etching or CVD.

Therefore it would have been obvious for one of ordinary skill in the art at the time invention was made to have a dielectric shield of thin material so as to control the ion density at the substrate in a predictable way by maintaining insulation of the shield in order to have uniformity of etching.

Regarding the shield being stationary, the shield is not disclosed rotating during processing. The additional facility is only for the sake of making shielded area variable for processes which may need different area shielded.

Specification recognizes the need for variability (Page 6 line 2) and states "By adjusting the size, location and geometry of the plate within the plasma reactor, the ion flux can be actively controlled" and claims the same in claim8.

By making the angle of shield variable the effective size of the shield becomes adjustable.

Lenz et al disclose support structure having six suspended supports but do not disclose support structure with three members.

Having three support members for a circular object is common. It would be obvious to have a minimum number of supports consistent with mechanical stability.

Ilya Perlov discloses a common support structure using a spider of three vertical members (Fig 1).

Therefore having a support of three members would have been obvious for one of ordinary skill in the art at the time of invention.

Regarding claim 8, as the shape and dimension of the shield plate determines the ion density distribution it would be obvious to optimize that according to size of substrate, plasma chamber and process requirement.

Regarding claims 10-11, mean free path is a process parameter dependent upon pressure. Obviously, the dimensions of the apparatus depend upon the process parameters and are therefore optimized accordingly as a routine.

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa Kaoru (JP 04144130) in view of Lenz et al (US 5534751) and Ilya Perlov (US 5421893) as applied to claim 1 and further in view of Henderson et al (US 6008130).

Ogawa Kaoru discloses a plasma chamber (Fig 3), a circular (solid) shield plate and a support structure for the shield plate (Fig 3-3).

Ogawa Kaoru or Lenz et al disclose shield plates and a support structure for the shield plates but do not explicitly disclose fully rounded edges.

Henderson et al disclose a plasma chamber (Fig 1), shield plates with rounded corner edges and a support structure for the shield plates (Fig 1-32).

Therefore it would have been obvious for one of ordinary skill in the art at the time invention was made to have a rounded edge of the shield plate for safety reason as well as not to have deposits, which could easily flake off.

Response to Amendment

Applicant's arguments filed 10/18/2004 have been considered but not found persuasive.

Applicant argues that Kaoru does not anticipate claim 1 because Kaoru does not disclose a support structure having three supports.

This point is now moot as anticipatory rejection is removed in view of the amendment.

Applicant argues that Kaoru relies on a two point supporting structure and rotatable shield plate.

As discussed above, In Kaoru the rotation of the shield is only to provide adjustability and is not needed during processing. Regarding the support structure comprising 3 supports to suspend the shield or to hold by three from below, these are merely art recognized equivalents.

Moreover, three-member support (Perlov) and suspended support (Lenz) is disclosed in the prior art.

Applicant argues that there is no motivation to combine Kaoru and Lenz as Lenz discloses individual rings between plasma and chamber and not between plasma and substrate.

Lenz is used for its support of shield similar to an alternative embodiment of the invention. Therefore, the motivation for the combination is proper.

Similarly motivation to combine Kaoru and Perlov is proper since Perlov is used only to disclose mechanical support using three members.

Applicant argues that there is no motivation to combine Kaoru and Henderson as Henderson teaches the same integration mechanism as Lenz.

This issue has been addressed before while discussing Lenz.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 571 272 1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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